Norfolk
Department of Planning & Community Development

Division of Building Construction Services
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**Policy Admin 05-05**

**City of Norfolk Commercial and Residential Inspection Checklist**

Site Inspection

- Site, location and setback measurement according to approved plans and Zoning:
- Check the required setback from all property lines.
  - Standards: Exterior walls must be at least 5 feet from property line or be rated one hour fire resistance per Section R302.1 {Note: More setback needed if zoning requirements are required.}
- Posted address is on project site per Section R325.1 and Policy Build 05-03.
  - Standard: A legible address must be posted, visible from the street.
- Check the required setback from any other easement.
  - Standard: A zoning code setback normally will supersede the required setback from the building code. A setback from an easement may be required as well.
- Check the orientation on the lot. Is the house "reversed"?
  - Standard: The house must sit on the property as approved by Zoning and Building Departments. Anything different must be approved beforehand.
- Check for erosion and siltation control.
  - Standards:
    - Siltation fence must be located where drainage would otherwise cause siltation or erosion.
    - Drainage inlet protection with sandbag
    - Tire wash available to prevent siltation on streets
- Is termite treatment complete? (Section R324).
  - Standard: Review documents by the installer of termite treatment to verify completion.
- Is the land in a special flood hazard area established by Section R301.2(1)?
  - Standard: Use the latest flood hazard map approved by FEMA and GIS to verify that the site is outside the special flood hazard area unless otherwise protected.
- Compliance with flood elevation height according to Section R327.
  - Standard: FEMA requirements for flood plain elevation height along with a 1 foot freeboard (Norfolk) is required for buildings in an "A" Zone. An as-built survey is required to demonstrate this before a final inspection. Flood-resistant construction is required below this elevation that includes:
    - Plumbing facilities
    - Mechanical equipment; vents, ductwork, etc.
    - Electrical wiring and devices
    - Framing, drywall, vents, etc.

Footing

- Are the approved plans on site?
  - Standard: Plans are required to be on site during inspections.
- Check soil conditions: Is soil suitable to support structure?

    - Standard: Examine questionable soil conditions. Is any fill tested by soil engineer for compaction? (Table R401.4.1 and Section R401.2 and 4). Expansive or collapsible soil conditions need a soil report (Section R401.4).
- Does project require a special inspection? Is the engineering report available?
    - Standard: If special inspection is required, you must ensure that this is performed and approved before conducting inspection.
- Are there interior bearing walls that require footings?
    - Standard: Interior bearing walls must be supported by footings according to Table R403.1.
- Does finish floor height meet flood plain requirements?
    - Standard: In a special flood hazard area, the height of the finish floor is critical. Order certification from licensed surveyor to ensure required height.
- Are roots and extraneous debris removed from bottom of trench?
    - Standard: No roots, wood or extraneous debris is permitted in footing trench. This will cause voids in concrete and result in a weaker footing.
- Verify width, depth, and thickness of proposed footing
    - Standard: The footing size is based on load bearing capacity of the soil and the load imposed. For most soil conditions, a single story bearing wall must be at least 16" in width and 12 inches below undisturbed soil and at least 6 inches in thickness. Insert Table R403.1
- If fill earth is used, is soil report complete?
    - Standard: Fill over 24 inches requires a soil investigation report.
- Verify footing thickness with grade stakes, marks on the side of excavation or height of form boards.
    - Standard: In order to predict that the concrete pour will provide the required thickness of footing, a grade stake should be visible to mark the finish height of the footing. Measure this thickness and ensure that it is at least 6 inches. Verify that grade stakes are not wood.
- Verify that bottom of footing is level or properly stepped
    - Standard: The bottom of footing can slope a maximum of 1:10 without providing stepped footings.
- Verify that any required reinforcing steel is installed with proper size and lap, and separated from earth
    - Standard: Reinforcing steel provides tensile strength for concrete, which otherwise, has very little. The steel is required in seismic zones D1 and D2. The size, center spacing and lap is specified in Section 403 and normally on the approved plans.
- Does the concrete ordered have a minimum strength as required. (Section R402.2).
- Is the concrete that will be exposed specified to be air-entrained? (Section R402.2).

Foundation walls or Masonry/Concrete Walls

- Verify the height of the wall and the finish floor
- Is reinforcing steel installed per plan? Vertical? Horizontal? Ties? Joint reinforcement?
- Check for proper lap in reinforcing steel (40 bar diameters)
- Verify the thickness of foundation wall block.
- Verify that wall is prepared for grout placement; cleanliness of cells and cleanouts
- Verify that required anchor bolts are on site and ready for installation
- Are grout pours over 6 feet high? If so, are cleanouts provided?
- Are there any egress windows? Check height of sill < 44"
- Check for required beam pockets? Beam clearance? Anchor bolts? Bolt size? Spacing?
- Check bond beam design width, required reinforcing steel
- Verify that mortar: head and bed joint are completely filled with mortar.
- Check for incorrect use of admixtures (during construction)
- Is crawl space provided with adequate ventilation? Flood vents?

- For Insulated Concrete Form Walls (ICF's), check thickness of form and reinforcement.
- Is adequate drain tile provided for controlling ground water?
- Is adequate damp proofing provided for basement walls?
- Do foundation piers have unsupported height over 4 times the least dimension?
    - Standard: over four times the least dimension, piers must be solid or grout-filled hollow block per Section R606.5

Pre-Slab concrete pour

- Is soil compacted properly?
- Are there interior footings for bearing walls? Are they installed properly?
- Make sure that no pipe is installed in footings?
- Is finish floor at the proper height?
- Is there a masonry fireplace that needs a footing?
- Are electrical conduits installed properly?
- Are copper and non-metallic pipes protected from abrasion?
- Verify the required thickness of the slab
- Verify rebar for restraining walls are bent into the future slab
- Is vapor barrier provided?
- Is termite proofing complete?

Floor and roof deck nailing inspection

- Verify the species and grade type of lumber is correct? (Example: Doug Fir #2)
- Verify the size and type of framing lumber is used correctly. (Example: 2X12s @16" O.C.)
- Check that wall height is according to the approved plans.
- Verify that roof sheathing materials is adequate for span and is per plans. Look for panel span index (Example: 32/16)
- Verify staggered layout of panels and orientation is perpendicular to supports.
- Verify the condition of panel; look for de-lamination or excessive saw cuts.
- Verify bedroom egress windows are at proper height (Not to exceed 44" at sill height).
- Verify room sizes are per plan and windows are per plan.
- Check nailing for sheathing: Look for number of nails and center spacing. Use plan for requirements.
- Firestopping walls and penetrations

Shear wall installation inspection

- Do shear walls segments match the approved plan for length and location?
- Bracing requirements adjacent to garage doors or short wall sections
- Do the materials for sheathing match approved plans for type and thickness?
- Does the nailing of sheathing to wall frame match the approved plans for type and center spacing? Nail gauge? Screw size?
- Is any required metal bracing installed on shear wall section properly?
- Are connections between the shear wall section and the foundation installed according to plan? Hold downs? Foundation bolts?
- Are there any gaps in the shear wall diaphragm not over a framing member?
- Verify the required stud size and center spacing for shear walls.
- Is complete load path provided for shear transfer?

Final Frame installation

- Verify that all other utility inspections have been approved by trade inspector(s).
    - Standard: Previous inspections must have been approved before calling for subsequent inspections, and certainly before covering work.
- Is everything nailed together properly?
    - Standard: Everything that relies on a connection for structural integrity must be fastened together properly.
- Are all joists, girders, headers and beams installed correctly according to allowable span and imposed load?

    - Standard: Verify that all structural members match the approved plan for size and location within structure.
- Are all structural members installed plumb and level?
    - Standard: Look for improperly installed structural members. Unless designed to do so, all structural members must be installed true and plumb.
- Check for excessive cutting and notching of framing members.
    - Standard: Figure R502.8
- Verify wall corner construction; look for overlap connections. Verify that intersecting walls are properly supported.
    - Standard: Figure R602.10.5
- Verify that lateral bracing is installed properly and installed in locations according to plan.
    - Standard: Table R602.10.3
- Verify that any required bridging is installed.
    - Standard: Based on the depth of joist, midspan blocking may be required. Joists larger than 2 X 12s must have bridging or blocking at 8 foot intervals.
- Verify that all wall openings (doors and windows) are where they are supposed to be).
    - Standard: Both an architectural and structural requirement. Field conditions must match the approved plan.
- Make sure that rise and run for stairs is correct.
    - Standard: A maximum of 7 ¾ inch rise and a minimum 10 inch run is required.
- Check if each rise/run is within 3/8".
    - Standard: Each rise and run can vary a bit, but only 3/8 inch maximum.
- Check for required headroom in stairs and hallways.
    - Standard: 6 foot 8 inches is minimum ceiling headroom required for stairs.
- Check for required width for stairs and hallways.
    - Standard: Minimum width for stairs is 36 inches. Handrail are permitted to encroach 4 ½ inches.
- Verify that changes in floor level from room to room are on plan.
    - Standard: Floor level changes can affect safety in several ways. Stairs may be required, and structural design may be compromised. Make sure these have been approved prior to calling for inspection.
- Verify that the overall height of the building is per plan.
    - Standard: Height of a building is both a structural issue as well as a zoning concern. It will be your problem if the building is higher than permitted.
- Verify that attic access is provided and meets the minimum size Standard: Attics are more than a place to store Christmas decorations. Water supply pipe, sewage vents, gas exhaust vents, supply and return air ductwork, mechanical equipment, electrical wiring, as well as insulation can be in an attic. Proper access is required (22" X 30") or (22" X 30").
- Verify that sill plates are pressure treated or otherwise approved. Standard: In order to retard insect infestation and deterioration of bottom plate, it must be of the type to resist decay. A pressure treatment is required unless the species of the wood naturally resists decay.
- Verify that anchor bolts are installed and according to plan
    - Standard: Bolts must be not less than 6 feet apart (2 bolts per piece), within 12" of ends and 2 bolts per piece. Make sure that all anchor bolts are tightened and have washers.
- Make sure that wall frame and roof structure are properly connected.
    - Standard: Based on seismic and wind conditions, a roof system can separate from a wall system unless connected properly. The industry standard is to install metal connectors between wall frame and every roof trusses.
- Check for required fire blocking throughout. Can smoke move, concealed inside a wall frame, staggered framing, soffits, drop ceilings, stair stringers, vent penetrations, chimneys, etc?

    - Standard: All holes and penetrations in wall frame must be blocked to prevent smoke from entering attic. The materials include wood, wood structural panels, batts or blankets of mineral wool or glass fiber.
- Check for required structural blocking at points of bearing.
    - Standard: Floor joists must be blocked at points of bearing. Roof framing with a depth-to-thickness ratio over 5-1 must be provided with blocking at points of bearing. Trusses must be blocked per manufacturer specifications.
- Proper installation of windows and doors
    - Standards: Windows and doors must be installed per manufacturer.
- Weather protection is provided.
- Energy efficiency requirements are met.
- Proper egress windows in bedrooms is provided.
- Proper illumination and ventilation.
- At least one door is at least 36" in width.
- Check is manufactured trusses are installed correctly: Review sealed calculations & drawings.
    - Standard: An engineered design for trusses will specify conditions. Installation standards will be listed by truss manufacturer and include allowable loading, required bearing points, and permanent bracing.
- Check is I joists are installed per manufacturer's specifications.
    - Standard: Manufactured I joists must be installed according to their design
- Look for minimum size of habitable rooms, hallways and stairs.
- Based on location, verify that any required safety glazing is installed (or will be).
- Verify that all required flashing is installed correctly.
- Verify that top plates are doubled and ends are offset at least 24"
- Check fireplace for following requirements:
- Flue liner installed
- Smoke chamber size and materials
- Hearth dimensions as required based on fireplace size.
- Firestopping in chimney chase
- Chimney height above roof
- Clearances to all combustibles and Manufacturer's specifications
- <u>Pre-Insulation pickup</u>
- Garage to house separation?
    - Standard: ½" drywall is required between house and garage.
    - 5/8" Type X if habitable space is above garage.
    - Walls supporting rated separation must be equal protection.
- Door requirements:
    - Standard: 1 3/8" solid core door or 20 minute rated door is required between house and garage.
- Duct penetrations protected
    - Standard: Ducts penetrating garage separation wall must be 26 gauge material and have no openings into garage.
- Electrical boxes in separation walls or floor ceiling assemblies
    - Standard: Electrical boxes must be rated for separation wall. Most are, but these cannot be placed Back-to-Back in a wall separating house from garage
- Pull down ladder in ceiling rated with self-closure
    - Standard: Any pull-down ladder in garage-house separation envelope must be rated.
- Is fireblocking complete?
    - Standard: Double check all required fireblocking. {This is the most common reason for rejection at this stage}.
- <u>Insulation & Energy Code</u>
- Are proper materials installed?

    - Standard: Only approved materials may be used as insulation materials. These are manufactured type.
- Are all windows & doors installed according to the standards required on the approved plan?
    - Standard: Windows and doors must meet the energy standards for your climate zone. They will be identified with a label indicating a U value. Check this against the approved plans.
- Is there an insulation certificate available (or required) to certify compliance with installation?
    - Standard: The installer must leave you a certificate indicating that the insulation has been complete. This certificate will indicate the type and value of the insulation.
- Are all exterior walls insulated?
    - Standard: Verify that the walls are insulated properly according to your climate zone. Insert Table N1102.1.
- Is Ceiling or attic insulated?
    - Standard: Ditto
- Is floor or crawl space insulated?
    - Standard: Ditto.
- Is vapor barrier installed?
    - Standard: A vapor barrier is required to be installed on the warm-heating side of the insulation. Make sure this is complete.
- Is cross-ventilation provided in attic and crawl space?
    - Standard: Cross ventilation is required in attic and crawl space at the rate of 1 square foot for every 150 square foot of attic or floor space it serves.
- In attic, are baffles provided at soffit ends to facilitate required ventilation.
    - Standard: To facilitate ventilation, on eave or cornice vents, a 1 inch clearance is required. Baffles are one approved way to help provide this.
- Is flexible duct for supply and return air insulated to R5 per Section N1601?
    - Standard: Ductwork inside, yet in unheated spaces must be insulated to R5. Outside ductwork must be insulated to R8.

<u>Siding and veneer installation</u>

- Is the proper siding installed according to the approved plans?
    - Standard: Verify that siding matches the approved plans.
- Is there proper connection between siding and wall frame?
    - Standard: Nails? Screws? Staples? Check center spacing. {Insert Table R703.4}
- Is veneer properly connected to wall frame with structural ties?
    - Standard: Masonry veneer installation:
- Weep holes installed?
- Cleaning of grout behind veneer?
- Brick ties installed properly?
- Proper installation of EIFS systems
    - Standard: EIFS is a manufactured veneer system and as such MUST be installed according to the product listing.
- Proper installation of Stucco systems
- Three coat systems
- Proper lath and lath attachment to framing member
- Proper moisture barrier backing; lap in joints? Doubled paper?
- One coat systems
- Proper lath and attachment to framing member
- Proper moisture barrier backing installation; lap in joints
- Fill penetrations with caulking according to product listing
- Is lath installed correctly? Proper lap? Correct gauge wire? Center spacing for staples? Connected to framing elements?

- Proper installation of manufactured siding
    - Standard: Check for required center spacing of framing members. Check for size and type of attachment required. Otherwise use Table R603.4
- Is building paper installed for weather protection? 2 layers on solid substrate?
- Is vapor barrier installed?
- Are penetrations caulked properly?

Roofing material underlayment (Dry-in)

- Is proper roof material installed according to approved plans? And slope?
    - Standard: Roofing material must be installed according to its intended use and slope. Product listing will indicate the required slope and installation requirements.
- Is underlayment installed according to the product listing for roofing material?
    - Standard: Normally, underlayment is specified by manufacturer of roofing product.
- Check for required overlap of roofing material according to product listing.

Drywall nailing

- Check on proper thickness for ceiling?
    - Standard: Is sag-resistant drywall required for 24" center supports? If water based texture is sprayed, then it is required if ½ inch thick.
- Nail size and center spacing? Screw size and center spacing?
    - Standard: Check for required connection details. Insert Table R702.3.5.
- Double layers of drywall require separate inspections and different connection details.
    - Standard: If you install two layers of drywall to achieve a rated wall or ceiling, make sure that both layers are inspected.
- Proper drywall installed depending upon location:
    - bathroom
    - covered patio

Final Inspection

- Verify that all other inspections are approved by inspector
- Check the outside grade. Does it allow surface drainage away from building?
- Are outside and interior guardrails and handrails installed to proper height and opening? (Guardrail: 36" high and center spacing so that a 4" ball cannot pass through; Handrail: 34-38" above the nosing of tread).
- Where required, is safety glazing identified?
- Check for fireplace safety: Required hearth extension? Separation from combustibles? Shut off valve in proper location? Etc?
- Is solid core door between garage and house installed?
- Energy efficiency stamp for windows and doors installed?
- Permanent address installed on building or property?

- Utility installations
- Water service meter
    - Standard: Installation standard is regulated by water company. Meter size is regulated by plumbing code based on total water supply demand of dwelling.

Underground Drain, waste & vent piping

- Are the approved plan on site?
    - Standard: The approved plans are required to be on site during inspections.
- Is the permit posted?
- Proper materials for pipe: Is pipe identified with label?
    - Standard: All drain, waste and vent pipe is required to be manufactured type and marked with identification. The label will indicate the type of pipe and its listing.
    - Table P3002.1 IRC.
- Proper use of DWV fittings? Improper use of Sanitary tee?
    - Standard: DWV fittings are approved for use as listed and tested. Certain fittings may only be installed in a specific direction. For example, a sanitary tee must be installed in an upright direction and may not be installed on its back.
    - Table P3002.1 IRC.
- Sewer Tap connection: verify depth and proper tap: Is a drawing required?
    - Standard: Connecting to the public sewer is critical. If the property are not clearly established, then a survey must be provided and the property lines located. A Norfolk Cleanout box is required to be located on private property as close as possible to the property line.
- Backflow prevention installed if needed
    - Standard: If sewer inlet is lower than nearest manhole, backflow prevention is required and must be installed to prevent accidental backflow. Backwater valves must be provided with proper access according to Section P3008.
- Verify drain, waste and vent (DWV) size and placement.
    - Standard: DWV pipe system must be installed according to approved plan or plumbing code standards.
- Verify proper support for pipe
    - Standard: While underground, pipe must be protected against damage from stone or rock. A bed of sand may be needed to prevent such damage according to Section P2604.
- Check the capacity of each vent based on fixture load (Table P3107.3)
    - Standard: Generally, the vent must be at least half the diameter of the drain pipe it serves. More specific requirements are within code language.
- Check the capacity of each wet vent based on fixture load (Table P3108.3)
    - Standard: Insert Table P3108.3 IRC
- Check DWV fittings for proper use and direction.
    - Standard: Ensure that DWV fittings are proper and installed in the correct direction per Table P3005.1).
- Check horizontal pipe for required slope:
- Standard: Sewage must flow through gravity unless otherwise assisted. To facilitate this drainage, the pipe must be sloped at least ¼" per foot (1/4 inch per foot for 2 ½ inch and smaller pipe sizes and 1/8 inch per foot for 3 inch and larger per Section P3005.3).
- Joint integrity? Water tight? Leaks? Is water test provided for DWV? 10 foot head test?
    - Standard: A test of the DWV pipe system must be provided to ensure that pipe is connected properly. The pipe system must be water-tight and not leak. A head of 10 feet is required to ensure the proper pressure on the plumbing system per Section P2503.
- Check for cleanouts as required by plan
    - Standard: Cleanout fittings are required at different locations in the DWV system to facilitate the plumbers' ability to install a snake to clear a clog. Cleanouts must

be installed not more than 100 feet apart in horizontal drainage lines. Cleanouts must be installed at each change of direction greater than 45 degrees, except not more than one cleanout shall be required in each 40 foot run regardless of the change of direction per Section P3005.2.

- Verify proper trap arm sizes according to fixture and trap arm length based on pipe size:
  - Standard: Table P3105.1 and Figure P3105.3 IRC
- Building cleanout within 2 foot of building?
  - Standard: There must be a cleanout near the junction of the building drain and building sewer. This cleanout may be either inside or outside the building wall, provided it is brought up to finish grade or to the lowest floor level. An accessible interior building drain cleanout or test tee within close proximity of the building drain exit point shall fulfill this requirement per Section P3005.2.
- Water service pipe material, size and distance to water meter. Section P2904
  - Standard: Only certain pipe may be used for water supply. It must be identified with label indicating it use as water supply. The size is a function of the water pressure, demand and developed length. See approved plans.
- Location of all plumbing fixtures, piping material, sizes and layout. Chapter 27
  - Standard: Make sure that all plumbing drains are installed where they are expected to be. Measuring from exterior walls to centerline of plumbing fixture is the best way to do this.
- Show that water supply pressure is at least 40 pounds per square inch (PSI). Section P2903.3
  - Standard: Use a water pressure gauge to verify the required minimum pressure.
- Show that water supply pressure is less than a maximum of 80 pounds per square inch (PSI). Section P2903.1
  - Standard: Use a water pressure gauge to verify the required maximum pressure or provide a pressure reducing valve.
- High Rise Buildings—require a booster pump to increase pressure to have adequate water pressure at the upper levels. However the lower levels must have pressure reducing valves to reduce the pressure to no more than 80 PSI.
- Show that pipe is protected from damage. Section P2603
  - Standard: Pipe must be protected from damage to prevent breaking. This can be achieved in numerous ways. If there is rock or other abrasive material, it must be removed.
- Show that pipes will be supported as required by Section P2605
- ABS or PVC used in DWV system must be schedule 40. Section P3002
  - Standard: Verify that pipe is schedule 40 by inspecting label on side.
- Show that drainage pipe fittings meet the standards for change of direction. Section P3005 and Table P3005.1 Standard: Insert Table P3005.1
- Show that drainage pipe size meet the limitations for maximum fixture units. Section P3005.4
  - Standard: Pipe must be large enough to carry sewage from fixtures with different fixture unit capacities. See Approved plan or review Table P3004.1 thyen P3005.4.1 and P3005.4.2.
- Show that vent pipes meet the minimum size requirements based on drainage pipe size. Section P3113 Standard: Vent pipe must be at least half the diameter of the required drain pipe served.
  - Show the size of trap for each fixture and demonstrate compliance with Table P3201.7 Standard: Insert Table 3201.7
- Specify that the distance between traps and vents is within the limitations of Table P3105.1 Standard: Insert Table P3105.1

<u>Underground and yard service water pipe</u>

- Does water service connection meet purveyor's standards?
  - Standard: Review installation standards from Water Company.

- System Pressure test with no leaks? If underground, test pressure must be working pressure or a minimum of 50 PSI. For Pex piping 200 PSI as per manufacturer's requirements.
    - Standard: Look for leaks in water supply pipe after system of test pressure is applied.
- Proper Burial depth?
    - Standard: Water pipe must be protected from damage. Freezing can cause that damage. The pipe must be at least 18 inches below grade and 6 inches below frost line.
- Proper use of primer for non-metallic pipe glue joints
    - Standard: Joints in pipe must be made with approved fittings and solvent cementing per Table P2904.4.1. Listing on cement may include primer. Review product listing and ensure this is provided.
- Proper materials for direct burial. Check for firmness of support and clean material used for bedding and backfilling of plumbing trenches and minimum cover.
    - Standard: Only proper materials are permitted to be used in water supply pipe buried underground. Review product listing.
- Are joints permitted under slab for material used?
    - Standard: Only certain pipe materials are permitted to have joints under a concrete slab. This includes a minimum Type M copper, CPVC, PB or PEX. Remember the test pressure for plastic pipe under slab is 200 psi.
- Is water supply pipe proper size based on Table P2903.6 and P2903.7?
    - Standard: Pipe size is based on developed length, water pressure and fixture unit value. Review approved plan or Table P2903.6 and P2903.7
- Water Pipe installed under a slab shall have only approved joints. Section P2904.5.1
    - Standard: Only certain materials are permitted under slab. Joints must be approved type per manufacturer' listing.

<u>Rough-in Plumbing</u>

DWV pipe

- Verify drain, waste and vent (DWV) materials, size and placement
    - Standard: Verify that pipe materials are identified and proper for use. The size and placement of pipe
- Check the capacity of each vent
    - Standard: Table P3103.7
- Check horizontal pipe for required slope (1/8 inch per foot for pipe 3" and larger and ¼ inch per foot for pipe 2 ½ inch and smaller).
    - Standard: Use standard level to determine minimum slope.
- Joint integrity? Is water test provided? Is pipe water tight? Leaks?
    - Standard: No visible leaks.
- Check for cleanouts as required by plan
    - Standard: Cleanouts are required based on change of direction and length of pipe per Section P3005.2.
- Verify trap arm length based on pipe size
- Note the maximum trap arm length.
    - Standard: Table P3105.1
- Does vent size match required size serving drain pipe?
    - Standard: Table P3107.3
- Check for required nail plates protecting pipe in wood framing member.
    - Standard: If bored or notched member provides less than 1 ½" from nearest edge of member, a nail plate or similar protection is required.
- Check for height of vent connection above fixture flood rims;
    - Standard: Minimum 6" above flood rim of fixture.
- Check that vent termination:
    - is the required distance below windows or other openings:

        - Standard: 4 feet directly beneath or 10 foot horizontally from such openings per Section P3103.5 and P3103.6.
- Check for required width of toilet space
    - Standard: 30 inches.
- Check that DWV vent pipe termination extends above roof
    - Standard: 12" above roof (Jurisdiction standard may be different).
- Check that shower meets minimum size and shape requirements.
    - Standard: least1024 square inches and 36" in diameter per Section P2709.
- Verify that shower pans are tested and hold water.
    - Standard: Pan should not leak.
- Verify that water heaters are installed in proper location;
    - Standard: Can the water heater be replaced in current position?

Water distribution pipe

- Check that materials for water pipe are proper for use.
    - Standard: Label on pipe will indicate approved use. Look for potable water use label per Section P2904.4.1.
- Check for water pressure test at system pressure?
    - Standard: Are there any leaks? Is air test pressure 50 psi? or working pressure. If Pex is used, look for 200 psi test per manufacturer's recommendations.
- Check for required nail plates protecting pipe in wood framing member.
    - Standard: If bored or notched member provides less than 1 ½" from nearest edge of member, a nail plate or similar protection is required per Section P2603.
- Check for any cross connections.
    - Standard: Look for instances where potable water supply may be polluted from non-potable liquids, solids or gasses, being introduced into the potable water system. Cross connections between an individual water supply (Well) and a potable public water supply is prohibited per Section P2902.
- Verify that hot water is on the left-hand side of fixture.
    - Standard: Hot water valve must be on left side of faucet.
- Verify that water heater has temperature and pressure relief valve to proper location.
    - Maximum pressure relief valve setting is 150 psi
    - Maximum temperature setting is 210 degrees F.
    - Standard: PTR Valve must run to an exterior location (daylight) or to an indirect waste inside of the building per Section P2803.

Plumbing Final Inspection:

- Are DWV cleanouts installed where required per Section P3005.2?
- Is there adequate water pressure? Minimum pressure is 40psi and maximum is 80 psi per Sections P2903.3 and P2903.3.1.
- Are water saving fixtures installed? (1.6 gallon water closets?)
- Are all fixtures properly caulked?
- Are temperature and pressure relief lines installed and functional per Section P2803?
- Are all fixtures installed and operational?
- If a pressure reducing valve, backflow preventer, or check valve installed in the water service line that prevents pressure relief through the building supply, then an expansion tank is required to protect against thermal expansion per Section P2903.4.
- Are pressure relief valves installed with expansion tanks?
- Is backflow required? Is it installed and operational?
- Does water heater have a pan installed?

# MECHANICAL INSPECTION CHECK LIST

- Check the required setback from any other easement per Section R 302.1
    - Standard: A zoning setback normally will supersede the required setback from the building code. A setback from an easement may be required as well.

- Posted address is on project site per Section R325.1
    - Standard: A legible address must be posted according to the standard of the jurisdiction: The size of the numbers and letters and their location may be regulated.

- Is the land in a special flood hazard area established by Section R301.2(1)?
    - Standard: Use the latest flood hazard map approved by your jurisdiction to verify that the site is outside the special flood hazard area unless otherwise protected.

## Gas Pipe Inspection [International Fuel Gas Code 2000 Edition]

- Check for proper support for gas pipe per Section 407 IFGC.
- Pressure test gas piping.
    - Standard: Use test gauge to verify pressure is stable and pressure drop does not indicate a leak in gas pipe Section 406 IFGC.
- Where are gas appliances? Are they in proper rooms?
    - Standard: Bedrooms, bathrooms, toilet rooms, and storage closets are prohibited from gas appliances with some exceptions per Section 303.3 and 303.4 IFGC.
- Do rooms with gas appliances have combustion air supply?
    - Standard: Except for direct vent and enclosed gas furnaces, all gas appliances must have adequate combustion air. They can get this from inside or outside.
- Verify that approved exhaust vents are provided for gas appliances Section 503 IFGC.
    - Standard: Except for direct vent and equipment with integral vents, all gas appliances must have exhaust vents.
- Check for proper gas pipe size according to demand Section 402.3(2) IFGC.
    - Standard: Calculate volume of gas demand based on fixtures connected to pipe. Gas demand is based on manufacturer's rating. Add up all demand on gas pipe and check adequate size.
- Check for proper location of shut off valve for fireplace Section 409 IFGC.
    - Standard: Normally within 6 feet, but may be within area remote from fireplace, but with ready access.

## Rough-in Mechanical equipment

- Are adequate heating facilities provided per Section 303.6 IRC?
    - Standard: Verify that equipment can heat house to 68 degrees?
- Does equipment have proper clearances to walls and combustibles Section G2509.2 IRC?
    - Standard: All clearances are normally established by the manufacturer of equipment and appliances. Some reduction in those clearances may be applied with Table G2409.2 [International Residential Code – 2000 Edition].
- Verify the listing on exhaust vents and ducts Section M1303.1 IRC.
    - Standard: Look for the independent third party testing and evaluation on product to ensure safe equipment. Unlisted appliances and equipment may be used, but have additional restraints on their use for safety.
- Verify the location for all required gas exhaust gas ducts Section R1801.1 IRC.
    - Standard: As appliances are roughed in, their exhaust ducts must be installed. The location, size and type of exhaust system are generally driven by the manufacturer. Use the manufacturer's product installation instructions as a guide for the required exhaust duct.

- Check the required distance between gas exhaust vents, vent connector and any combustibles (wood/drywall) per Section M1306.1 IRC
    - Standard: Heat flowing in exhaust vents can cause fires if too close to combustibles. For that reason, they must be separated from all combustibles such as wood and drywall. This is normally established by the manufacturer of the vent.
- Check that ductwork is installed per plans for size, routing and materials Section M1601 IRC.
    - Standard: Ductwork should provide heating and cooling to a conditioned space in the most efficient manner to reduce losses
- Verify adequate support for ductwork and that distribution boxes have support on at least three sides Section M1601.3 IRC.
    - Standard: Metal ducts must be supported with ½ inch wide 18 gauge straps or 12 gauge wire at 10 intervals. Non-metallic ducts must be supported based on manufacturer's specifications.
- Make sure that flexible duct is not damaged or kinked or twisted to restrict air flow Section 603.9 IMC.
    - Standard: Look for excessively constricted air flow in flexible duct material. This could mean poor conditioned air supply and damaging equipment and creating a dangerous condition.
- Make sure that supply and return air ducts are the proper size per Section M1602 and M1603 IRC.
    - Standard: In order to provide the safest, most efficient design, the proper ducts must be installed. This is normally worked out in design stage, so review the plans and compare what is installed. Did the installer get it right?
- Verify that wall vents (if any) are BW type per Section 503.7 and 607 IFGC.
    - Standard: Vents in walls are permitted if they are a BW (B-Wall vent).
- Verify that B vents have at least 1 inch clearance, are properly supported, and have proper slope Section 504 IFGC?
    - Standard: Most B vents require a 1 inch clearance to combustibles.
- Verify that other exhaust vents such as chimney flue vents have proper clearance to combustibles per Section 801.2 IMC.
    - Standard: The clearance is generally established by manufacturer, but reduced clearances are as outlined in Table M1306.2.
- Verify that appliances in garage are elevated above potential gasoline vapor Section M1307.3 IRC.
    - Standard: Ensure that platform supporting gas equipment is adequate for 18" clearance to garage floor for source of ignition in HVAC equipment or other gas appliances.
- Make sure that condensate drain lines are installed with proper materials and routed to an approved location Section M1411 IRC.
    - Standard: Does the drain line have proper slope? If in attic, is second condensate drain provided that terminates to readily visible location Section M1411.3 IRC?
- Verify that any required access and working space will be provided when equipment is installed per Section M1401.2 IRC.
    - Standard: The width and depth for appliance access varies depending on appliance type and location. For more complete explanation, see Section M1305. [International Residential Code – 2000 Edition]
- Verify that clothes dryer vent is of proper materials per Section M1501IRC.
    - Standard: Rigid pipe, (not flexible) and is at least 4" diameter, and is less than 25 feet in length with limited bends. Verify that no screens are on exhaust duct.
- Make sure that attic used for HVAC equipment is adequately illuminated per Section M1305.1.3.1 IRC.

    - Standard: Make sure that it has a switched light, service outlet and access platform and working clearance to equipment.
- Verify that exhaust vents terminate properly above roof per Section M1804.2 IRC.
    - Standard: Exhaust vents must terminate above the roof according to the manufacturer's installation instructions.
- Verify there is there an electrical outlet for servicing mechanical equipment per Section R1305.1.4 and E3803.4 IRC.
    - Standard: Outlet must be within 25 feet of equipment.
- Is a bathroom exhaust fan provided? Does it exhaust to the outdoors per Section R303.3 IRC per Section 501.2 and 501.2 IMC?
    - Standard: The vent must exhaust air directly to the outside.
- Verify that conditioned air supply is provided in each room according to required volume, based on room size per Section R303.1 IRC.
    - Standard: Air must be changed at the rate of .35 air changes per hour or a whole house ventilation system must be installed which provides 15 cfm of outdoor air.
- Verify that duct termination boxes are supported by adequate blocking per Section 603.1 IMC.
    - Standard: Termination boxes must be supported according to the manufacturer's specifications for ductwork.

<u>Mechanical Final Inspection</u>

- Is equipment installed and functioning properly?
- Do gas appliances have shut off valves as required?
- Are vent connectors installed properly? Check clearance to combustibles.
- Is equipment installed in garage protected from vehicle damage?
- Is adequate combustion air provided for gas equipment?
- Do exhaust vents terminate as required?
- Check for maximum length for flexible gas connectors (6' for ranges and dryers – 3' for others).
- Is equipment I garage elevated so that source of ignition is 18" above finish floor?
- Does all mechanical equipment have proper listing and labeling?
- Is condensate drain connected and operational?
- Is exterior mounted heat pump installed on 3" support?
- Does all equipment in attic have the required:
    - Access and working clearance?
    - Working platform? Correct size?
    - Ramp access?
    - Service outlets?
    - Switched light?
    - Means of disconnect within sight?

# ELECTRICAL INSPECTION CHECK LIST

- Electric service panel and temporary service connection
  - Standard: Panel must be secure and electrical parts must be protected from weather. The height is regulated by purveyor. Working clearance is 30" in width and 36" in depth.
- Is electrical ground installed properly?
  - Standard: a driven ground rod or a Ufer ground must be installed for a grounding electrode system. The connection of the grounding conductor to the electrode must be made with an approved type clamp.
- Verify electrical wiring and device layout. Is everything installed correctly?
- All electrical outlet, switch and light boxes must be identified with manufacturer and product listing.
  - Standard: There should be no home-made electrical components. They should all be factory made and have a listing such as UL.
- Make sure that in new construction that no panel boards are installed in clothes closet bathrooms or toilet rooms.
  - Standard: To prevent potential fire and other hazards, panels or subpanels cannot be in clothes closets, bathrooms, toilet rooms.
- Verify on new construction, that lights in closets have proper clearance to shelving.
  - Standard: Figure E3903.11 and Article 410-86
- Verify that wire size and type is correct size for installation.
  - Standard: Table E3701.4 and E3605.1.
- Verify that wire in stud wall frames is protected.
  - Standard: Protective plates are provided if wire is within 1 ¼" inch from edge of stud.
- Verify that smoke detectors are installed properly
  - Standard: Smoke detectors must be provided where required. They must be interconnected and hard wired to building power (Note that alarm systems may substitute).
- Verify that fan boxes are listed for use.
  - Standard: Ceiling fans are heavy and must be installed with proper support and wiring capacity. Look for identification on fan outlet box where these will be installed.
- Check for improper box fill: (too many wires inside outlet box).
  - Standard: Table E3805.11.1
- Make sure that metal boxes are grounded properly
  - Standard: metal outlet or light boxes must be grounded with grounding connection to box with green grounding screw.
- Make sure that grounds are tied together with proper connector
  - Standard: Ground wires must be electrically tied together with proper connector listed for this use. A crimped fitting is the most common method.
- Ensure that neutral wires are tied together with proper connection.
  - Standard: Neutral wires must be electrically tied together with proper connector listed for this use. A compression fitting (Wire nuts) is the most common method.
- Check for proper outlet spacing along a wall.
  - Standard: Table E3801.2; outlet provided so that no space is more than 6' from outlet; wall space 2' in length or greater must have outlet.
- Verify free conductor length outside of outlet or switch boxes.
  - Standard: Secure wires within 6" of outlet box to framing member.
- Make sure that #12 wire is installed for 20 amp circuits in kitchen.
  - Standard: Two, separate 20 amp appliance circuits are required in kitchen. These must be fed with #12 gauge wire. Check for required island outlets.
- Check for required separate laundry circuit (20 amp circuit using #12 wire).

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    - Standard: A single 20 amp laundry circuit is required for washing machine. This needs to be fed with #12 gauge wire.
- Make sure that no pendant fixtures are planned over bathtub. (look for product listing).
    - Standard: Unless listed, no light may be inside shower. No pendant fixture is permitted.
- Verify that exterior outlets are provided as required outside.
    - Standard: An outlet is required both in front and rear of house.
- Verify that any metal water pipe is bonded with proper clamp and is accessible.
    - Standard: Metal pipe must be bonded to electrical grounding system.
- Verify that outlet placement in bathroom lavatory is correct.
    - Standard: If there are two basins in a bathroom, an outlet or outlets must be positioned so that a cord being used by a person at one basin does not cross the other's basin.
- Verify that working clearance and access is provided.
    - Standard: Electrical equipment must be serviced periodically. For that reason, a working clearance must be provided. Normally, for most normal voltage purposes, there must be a 30 inch width and 36 inch depth where no other obstruction may be positioned.
- Verify that conductors are not in plenums.
    - Standard: The insulation on conductors can deteriorate when subjected to heat and blown air. None are permitted within plenums.
- Verify that cable or conductors are not installed in concrete, cinder block or adobe unless they are approved for that use.
    - Standard: Cable or conductors are design for specific use and some will deteriorate if installed within masonry.
- Make sure that motors are accessible and ventilated if required by manufacturer.
    - Standard: Motors may require a ventilated space to retard heat build-up and allow the motor to maintain a consistent temperature.
- Note certain limitations for NM cable.
    - Standard: NM cable, most commonly manufactured as ROMEX, is limited to uses within a building's wall frame system.
- Is a GFCI protected circuit provided as required in the house?
    - Standard: GFCI protection is required for bathrooms, kitchen, garage, outdoor locations, crawl spaces, unfinished basements, and bar sink receptacles.
- Is outlet spacing along kitchen counter proper?
    - Standard: Outlets are required every 4 feet and at every counter space 12 inches in width. Island counter spaces and peninsular counter spaces must be provided with outlets as well.
- Check for proper support for wire.
    - Standard: Standard size house wiring must be supported every 4 ½ feet.
- Range and dryer conductors must be 4 wire type per Article 251-40
- Bathroom circuit must be dedicated 20 amp circuit per Article 210-11
- Check for bonding on hot and cold water pipe in hydro massage tub per Article 680-73
- Check slabs for islands so that electrical wiring is in conduit per Article ____
- Check for any wiring to swimming pools per Article 680 and Chapter 41 IRC
    - Bonding
    - Trench depth
- Check for wiring connection in detached garages per Article ____
    - Bonding
    - Trench depth
    - Receptacle height
    - Sub panels